

THE UNIVERSITY OF KANSAS SCIENCE BULLETIN

VOL. XXIX, pt. II.]

OCTOBER 15, 1943

[No. 8

Herpetological Novelties from Mexico

By EDWARD H. TAYLOR,

Department of Zoölogy, University of Kansas

ABSTRACT: The following new forms of Mexican Amphibia are described: *Bolitoglossa cochranæ* (PLETHODONTIDÆ), Cerro San Felipe, Oaxaca, Oaxaca; *Rhyacosiredon leorac* (AMBYSTOMIDÆ), Near Río Frío, México, México; *Bufo perplexus* (BUFONIDÆ), Mexcala, Guerrero; *Bufo nayaritensis* (BUFONIDÆ), Tepic, Nayarit; *Tomodaactylus albolabris* (LEPTODACTYLIDÆ), Agua del Obispo, Guerrero; *Syrrophus nebulosus* (LEPTODACTYLIDÆ), Tonalá, Chiapas; *Microhyla mazatlancensis* (MICROHYLIDÆ), Mazatlán, Sinaloa.

THE following species are a part of the Edward H. Taylor-Hobart M. Smith collection (EHT-HMS), all being from México.

Bolitoglossa cochranæ sp. nov.

Type. EHT-HMS No. 24594, Cerro San Felipe, Oaxaca, Oaxaca, México. Richard C. Taylor and Edward H. Taylor, collectors, 1940.

Paratypes. EHT-HMS Nos. 17726-17727, August, 1938, E. H. Taylor; EHT-HMS Nos. 24589-24593, 24595-24599, U. S. N. M. No. 19483, July, 1940, Taylor & Taylor; all topotypes.

Diagnosis. A rather small species apparently related to *Bolitoglossa altamontana*. It differs from that form in having shorter limbs, the adpressed limbs separated by two costal folds in the adults. Tail shorter, about 70 percent head-body length. (In *altamontana* the adpressed limbs touch and the tail is equal to from 90 percent to 100 percent of head-body length, depending on age.)

Fingers and toes partly webbed, only the tip of first finger and toe free from membrane; 13 costal grooves; fold under tongue very slight; teeth large, faintly bifid at tip; parasphenoid teeth in two rather narrow series converging anteriorly.

Description of the type. Head broader than body, flattened between orbits; snout short, somewhat rounded in profile; canthus

rostralis lacking; loreal region sloping, not concave; nostrils far forward, nearly terminal, the distance between them a little less than interorbital width; posterior parts of eyelids tucked under a diagonal fold; length of eye one-fifth more than its distance to the end of the snout; a sharply-defined longitudinal groove from near eye to the ends of the nuchal fold; nuchal fold strong, the groove arising from its lateral edge passes up and meets its fellow on the middorsal line; a vertical groove begins at the longitudinal groove, runs down back of the jaw angle, and can be traced a short distance across the throat. Posterior hyoid horn forms a strong ridge from nuchal groove to above arm, as far as the second costal fold; 13 costal grooves, counting one each in axilla and groin, although these latter are not or but dimly indicated; a slight trace of a median dorsal groove; 10 costal grooves can be traced across the belly; anal opening a longitudinal slit, the walls within the cloacal lips, plicate; limbs moderately developed, when adpressed they are separated by two costal grooves; fingers somewhat flattened, conical, the pads under the tips only moderately developed; the web involves the first phalanx of the digits although it is somewhat excised between them. First finger has only the tip extending beyond the membrane; the order of size of the fingers is 1, 2, 4, 3. The web on foot involves the first phalanx of toes; only part of the terminal joint is free on first toe. The order of size for toes is 1, 5, 2, 4, 3, or (3 = 4).

Skin of head and sides pitted strongly and minutely corrugated; skin of dorsum very smooth; the skin is slightly folded longitudinally between the costal grooves; belly and under surface of tail without pits. A small glandular spot behind insertion of femur.

Sublingual fold not distinct; maxillary-premaxillary tooth series, 29-29; teeth heavy, slightly bifid at tip; mandibular teeth, 29-28; vomerine teeth 13-14 extending beyond outer level of choanae; the two series are narrowly separated medially, and are separated from the parasphenoid teeth by a distance equal to half the distance between the choanae; parasphenoid teeth in two narrow series diverging posteriorly, separated anteriorly.

Color. Body somewhat brownish with a lavender grayish wash. Numerous, small, black spots on dorsal and lateral surfaces of body and tail and limbs; belly dark lavender with a few light flecks along sides; chin and throat lighter with small light flecks.

Measurements of type and paratypes in mm. Nos. 24592, 24594, 17727; sex, ♂, ♀, ♀; snout to vent, 39, 53.5, 57; tail, 27, 34.5, 43; snout to arm, 12, 14, 15.5; axilla to groin, 21, 30.5, 32.4; width

of head, 6.8, 8, 8.8; head, to gular fold, 9, 10.8, 11; arm, 9.8, 11, 12; leg, 11, 14, 14.4.

Variation. Most of the specimens agree with the type in color and markings. However, No. 25590 is deep blackish lavender and the black spots can be discerned only when the specimen is submerged; No. 17725 is light brown with two lighter brown areas on occiput (visible in some of the other specimens). The hedonic gland on the chin is present in the males but is not especially conspicuous. The cloacal walls of the males are strongly papillate. A female specimen, No. 17727 contains 16 large ovarian eggs, 8 in each ovary. Since the oviduct is greatly distended it is presumed that the eggs are ready to be laid.

Remarks. All the specimens found were taken in tiny piles of leaves on the ground. They were found in a single locality at an elevation of about 8,800 feet. They were obtained on two different visits to the mountain. The species is named for Dr. Doris Cochran of the Department of Herpetology of the United States National Museum.

Rhyacosiredon leorae sp. nov.

(Plate XXVI, fig. 3)

Type. EHT-HMS No. 22560. Adult male, collected in a mountain stream near Río Frío, México, either in the state of Puebla or México (Balsas River drainage system), by Dyfrig McH. Forbes, 1939.

Paratypes. EHT-HMS No. 22561; U. S. National Museum No. 116629-116632, adults and larvae. All topotypes, same collector as type.

Diagnosis. A large species, maximum known size, 98 mm. snout to vent; more closely related to *Rhyacosiredon altimirani* than to *R. rivularis*. It differs from the former in having a longer body with relatively small limbs. The hind toes fail to reach the elbow by a distance equal to the width of one or two costal folds. The digits are broader, the tail more elevated at its base. The head is proportionally shorter and broader. Greenish olive above and dorso-laterally, thickly studded with distinct brown spots, the tail mottled indistinctly with darker and lighter; cream below.

- *Description of the type.* Width of head (21 mm.) less than the length (24 mm.); interorbital distance equal to length of snout and likewise equal to the distance between the nostrils, which are terminal; total length of eye (4 mm.) equal to its distance to the nostril; mouth very narrow; the labial fold visible on edge of lower jaw, but

partly overhung by a flap from upper lip. The neck is strongly constricted, its width (12 mm.); a distinct fold on the neck, back 19 mm. from tip of snout.

Arm strong, brought forward it reaches to slightly beyond nostril; order of length in fingers, 1, 4, 2, 3; of toes, 1, 5, 2, 3, 4; a skin fold on outer side of foot extending along the fifth toe, and a similar one on the hand bordering the fourth finger; a pair of tubercles on back part of palm and sole. Tail distinctly longer than head and body (in adults); a somewhat thickened dorsal fin and a trace of a ventral fin on the strongly compressed tail; elevation at base 12 mm. while the greatest depth of body is 15 mm.

Maxillary-premaxillary tooth series about 25-27 (counting certain spaces for absent teeth); teeth unequal in size, slightly bifid at tips; vomero-palatine series broken, together forming an arch which is broken medially; the number is 5 + 10 on each side, the teeth extending much anterior to the elongate choanae. Tongue very small, strongly lamellate, spongy, the tissue strongly pitted between lamellae.

Eleven distinct costal grooves, 10 costal folds (the axillary very indistinct but present in a paratype, making 12 grooves and 11 folds). Cloacal region strongly inflated, the inner edges strongly papillate.

Aside from very numerous microscopic pits on the head the remnants of the neuromast system is evidenced by larger pits distributed as follows: a double row begins above the nostril and continues to above eye; low on lores there are several pits irregularly arranged; one row runs below eye; between eye and jaw, and to a lesser extent behind eye are several pits; a row runs along the lower jaw. A dorsolateral series can be discerned, but only one or two pits of the lateral and ventrolateral series (scarcely more distinct in larvae) are evident.

Color. Olive to gray olive on top and sides of head and on back; the tail is very indefinitely mottled with grayish and tan cream, scarcely differentiated; lower sides and ventral regions dirty cream, there being some scattered pigmentation visible under a lens; limbs gray olive above. Dorsal and dorsolateral surfaces of head, body and limbs strongly spotted with dark brown.

Measurements in mm. (of the adults of the type series). Nos. 22560, type, 116629, 22561; sex, ♂, ♀, ♀, respectively; snout to vent, 81, 93, 98; tail length, 88, 104, 109; width of head, 21, 22.5, 23; length of head, 24, 26, 26; axilla to groin, 36, 46, 47; arm 28, 30, 29; leg, 30.5, 32, 33.

Variation. One of the specimens a large female has the depth of the tail less than in the other two specimens approaching in this character somewhat the condition obtaining in *altamirani*.

The specimens have the inside of the buccal cavity covered with well-defined papillae. The arrangement of the larval teeth is similar to that of the adults.

Remarks. It is presumed that the form is confined the upper reaches of the tributaries of the Balsas river. It will probably be found to be common in small streams originating in the glaciers and snows of Popocatepetl and Iztaccihuatl.

Bufo perplexus sp. nov.

(Plate XXVII, figs. 1, 2)

Type. No. 707 E. H. Taylor-H. M. Smith Collection; collected near the edge of the Balsas river, near the town of Mexcala, Guerrero, México, June 24, 1932, by E. H. Taylor and H. M. Smith.

Paratypes. EHT-HMS collection. Nos. 18213-18216; 18221-18224. About 10 km. northeast of Cuernavaca, Morelos; 682-683, 6209-6234, 18217-18220, at km. 133, near Huajintlán, Mor.; 6267-6271, 6273-6274, El Naranjo, Guerrero; 6235-6265, 18441, Tonalapam, Guerrero; 684-706, 708, 709, 708A, 6275 (Km. 252), 6266 (km. 240), 6276, vicinity of Mexcala, Guerrero; 25419-15422, vicinity of Chilpancingo, Guerrero; 813-818, 820-828, Tonalá, Chiapas. U. S. National Museum Nos. 116564 Puente de Ixtla, Morelos; 116565-116568, Tehuantepec, Oaxaca.

Diagnosis. A medium-sized toad, having a known maximum size of 66 mm. Apparently related to *Bufo marmoratus*, but with the cranial crests less distinct, the interorbital and postorbital crests forming an angle rather than a continuous curve, the supratympanic crest smaller, reduced to a mere boss on the postorbital crest; parotid gland much closer to the orbit, being separated only by a distance equal to the thickness of the crest. In adults, the females lack the wide diagonal lateral stripe of the female *marmoratus* and the males do not have the coloration, or the concentration of the rough dorsal tubercles to a broad band on the back, as obtains in the males of *marmoratus*.

Description of the type. Adult female. Head moderately thick, the frontal region tending to curve down somewhat; snout sharply truncate, the nostrils near the most anterior point, which overhangs the mouth slightly; length of eye (7.5 mm.) longer than the snout (6.1 mm.); tympanum a little higher than wide (4.5 mm. \times 4 mm.), its greatest diameter a little more than half the diameter of the eye

(on right side tympanum abnormally subcircular); parotoid gland somewhat rounded oval, its greatest length 7.2 mm., in contact with the postorbital crest, and separated from the orbit by the thickness of the crest. Canthal crest lacking, but the region is elevated a little; interorbital crest low, as is the postorbital, the two forming an obtuse angle rather than a curve; the pretympanic ridge indistinct but elevating the anterior margin of the tympanum; parietal crest indicated by a slight boss or tiny ridge; preorbital crest not or very indistinctly indicated; jaw with a slightly elevated ridge below the eye; interorbital width equal to an eyelid; area between the interorbital crests and the snout smooth, flat, with a slight depression continuing between the nostrils.

Tongue elongate oval, not emarginate behind; choanae large, transverse; palatines with odontoid rugosities. (Males with voeal sacs.)

Arms and legs short; first and second fingers subequal in length; all fingers lacking distal subarticular tubercles; a very large median palmar tubercle; a small inner tubercle but no outer tubercle evident; toes one third (or somewhat more) webbed, the fringe continued to near the tips of the digits; an elevated, slightly compressed, inner metatarsal tubercle; a small outer metatarsal tubercle; tarsal fold faintly indicated, bearing a few tubercles.

Skin of back with numerous pustules each bearing fine granules; parotoids granular; sides pustular while the ventral surface is entirely covered with uniform flat granules. (In males, skin much rougher and the granules often with horny tips.)

Color. Generally brown-olive above, with markings or reticulations of olive or fawn indicated; a V-shaped dark spot on the interorbital region the sides of which extend upon the upper eyelids; anterior to this the snout and the anterior parts of the eyelids fawn or grayish; sides of the snout, lip and tympanic region with brown spots; a median light stripe extends from the occiput to vent; arms and legs variously barred with brown, the median stripe most distinct; tips of the digits with some horn color; entire ventral surface creamy white, with some slight pigmentation on chin and breast.

Measurements in millimeters of type. Snout to vent, 61; width of head, 25; length of head, 20; depth of head at tympanum, 10.2; depth of head in front of eye, 9.1; arm, 38; leg, 73.5; tibia, 23; foot, 35.2.

Variation. The large series from numerous localities shows a remarkable constancy in the essential specific characters. The color

is variable, and the specimens collected at night seem to show the color pattern better than those taken in daytime. Most of the daytime specimens were taken from under rocks, or buried in the earth. In these some appear very dark and there is little or no pattern visible unless the specimens are placed under water, in which case the pattern can frequently be distinguished.

Males show the typical nuptial asperities on the first two fingers and the skin is rougher than that of the females. Their pattern often shows two larger paired spots on the back which are contiguous with other spots; and they are smaller than the females.

Remarks. The largest aggregation of these toads was encountered at a small rivulet that flows to the south of Tonolapam, Guerrero. While camped here I collected 25 specimens within a radius of 50 feet of my camp. One might have collected hundreds in the general locality without trouble. The rivulet was teeming with very small black tadpoles, and I presumed that the breeding had taken place some time before. None were calling, and none were in the water at this time.

The species when seen in series is very easily distinguished from *Bufo marmoreus*. (See pl. XXVI, figs. 1b, 2.) However, I suspect it will be found that specimens are already in some museum collections catalogued under the name of *marmoreus*.

The known range includes the Balsas basin of northern Guerrero, southern Morelos, southern Oaxaca and the Pacific lowlands of Chiapas. It may be present in southern Guerrero, but it has not yet been found there. It is replaced, for the most part by *Bufo marmoreus*, yet *Bufo gemmifer*, *horribilis* and *coccifer* have also been taken.

Bufo nayaritensis sp. nov.

(Plate XXVI, figs. 1, 1a)

Type. No. 397, E. H. Taylor-H. M. Smith Collection; collected at Tepic, Nayarit, July 28, 1934, by Edward H. Taylor.

Paratypes. EHT-HMS No. 380-396; 398-426, 426A. (Nos. 401-404 skeletons) Topotypes, same data as type.

Diagnosis. Related to *Bufo mazatlanensis*, but differing in having a relatively longer first finger, nearly a third longer than the second; a larger parotoid, which equals or is greater than the length of the eye; a narrower interorbital region; the interorbital crests are nearly parallel for most of their length, the metatarsal tubercles are a little larger and the feet are relatively larger; the tibiotarsal articulation reaches to the tympanum.

Description of the type. Head bearing rather low crests, those on the canthi lowest, running nearly parallel anteriorly; preorbital, supraorbital and postorbital crests of about equal height, the latter having a short pretympanic and supratympanic branch; a short, low occipital crest; an infraorbital crest from below the tympanum to the anterior level of the orbit; tympanum moderately large, sub-circular, its diameter (5.2 mm.) equal to a little more than half of the eye (8.5 mm.) and slightly more than half the distance between the pre- and postorbital crests (9.8 mm.); the width of an eyelid is 5.1 mm. as compared with the distance measured from the level of the interorbital crests of 7 mm.; length of snout 8.5 mm.; greatest length of the parotoid 10 mm., its width 6.2 mm.; the distance between the parotoid and the postorbital crest, 3.1 mm.; nostril nearer eye than edge of lip; elevation of snout at nostrils 6.4 mm.; greatest elevation of head (to top of crest) 11.1 mm.

Tongue small, oval, not notched, free for about one-third of its length; opening of the vocal sac sinistral; palatine with a few rugosities.

Arm short; first finger thick, more than a fourth longer than the second; a fourth or fifth shorter than the third; the outer subarticular tubercle divided on the third finger, while on the others they are very slightly bilobed; outer palmar tubercles large, oval; inner covered with nuptial excrescences of black-brown horn; similar excrescences on the dorsal surface of the first finger, most of the surface of second and the inner side of the third; the palm and sides of fingers with numerous conical tubercles; toes except third, webbed for about half their length, the webs continued as ample, serrate fringes to the tips. Inner metatarsal tubercle elongate, sharply conical anteriorly, its length a little less than that of first toe; outer tubercle small; the subarticular tubercle on the fifth toe bifid; no tarsal fold but the tubercles occupying its position are a little larger than others; tibiotarsal articulation to the tympanum; when legs are folded at right angles the heels are separated by about 3 mm.; sole with numerous tubercles.

Skin strongly pustular; an irregular row of larger pustules on either side of the middle of the back; tubercles beset with numerous dark brown horny spinules; no noticeable lateral fold bearing larger tubercles; venter uniformly granular.

Color. Above dirty brown, somewhat variegated with a very dim suggestion of a lighter median streak when examined under water; below yellowish; the sides bearing yellow or cream tubercles among

the darker ones; the underside of the foot and hand darker than the venter; upper lip yellow, bearing a few dark-brown spinules; crests, deep brown.

Measurements (in mm.) of type. Snout to vent, 70; width of head at tympanum, 26; length of head, 21; greatest depth including crest, 11.2; arm, 36; hand from back of palmar tubercle to the tip of third finger, 15.2; leg, 84; tibia, 27; foot, 38; from posterior edge of metatarsal tubercle to end of fourth toe, 24.

Variation. The large series shows but little variation. The size of the parotoid gland is constant, some slightly larger, some perceptibly smaller. In practically all cases the length exceeds the greatest distance between the pre- and postorbital crests. The vocal slits are sinistral and dextral in the proportion of 3 to 5; none were found having slits on both sides. The maximum size of the males is 73 mm; seventeen of the lot are above 65 mm., three above 70 mm.

Tomodactylus albolabris sp. nov.

Type. EHT-HMS No. 29568, collected at Agua del Obispo Guerrero (km. 351), Aug. 24, 1941, by Edward H. Taylor.

Paratypes. EHT-HMS Nos. 6944, 6945, 29567, 29569, 29570, Agua del Obispo; 6939, 9 km. south of Mazatlán, Guerrero.

Diagnosis. A small species, maximum size 23.8 mm.; disks of two outer fingers distinctly widened, truncate; posterior part of the ventral disk granular; back and sides more or less pustular; tibiotarsal articulation to eye; tympanum rather indistinct, its greatest diameter less than half of the eye; lip light, usually silvery to white; a red or red orange spot on the anterior part of the thigh, sometimes extending onto the groin, and also some reddish or orange spotting on the posterior face of thigh.

Description of the type. Snout pointed the tip slightly rounded, and lacking a distinct canthus rostralis; upper loreal region nearly vertical, the lower sloping, somewhat concave; diameter of the eye (2.6 mm.) equal to the distance between eye and a point a little beyond the nostril; interorbital width (2.9 mm.) much greater than the width of a single eyelid (1.75 mm.); tympanum partly concealed by skin, higher than wide; its greatest diameter (1.2 mm.) less than half the length of the eye, while its narrowest diameter is about equal to its distance from the eye.

A large vocal sac, the internal slits on the floor of the mouth large, and the skin distended externally; no vomerine teeth; choanae large, lateral (deformed on one side); tongue pear-shaped widened

posteriorly, without trace of notch or emargination behind, free behind for half its length.

Arms slender, the two outer fingers with distinct truncate disks wider than the remainder of the digits, while the tips of the inner fingers are not noticeably wider than the digit; first finger equal to or a little shorter than second; median palmar tubercle large, that at the base of the first finger less than a fourth as large, while the distinct outer tubercle is still smaller; subarticular tubercles large, especially those under first two fingers; intercalary and supernumerary tubercles present, the latter numbering five; numerous small granules on the sole and between the bases of the digits. A single small tubercle on the wrist.

Legs short, the tibiotarsal articulation when brought forward reaches to the back part of the eye, and when folded at right angles the heels touch or are minutely separated; tips of toes truncate, not or but slightly widened at the tip; fifth toe small the length of its free part contained in the free part of the fourth, three and a third times; subarticular tubercles of inner toes larger than those on outer; intercalary and supernumerary tubercles present, but rather small; sole covered with very small, distinct tubercles or granules; inner metatarsal tubercle large, but smaller than the subarticular tubercle of first toe; no tarsal fold.

Skin of the head smooth while that of the back is also smooth although the pustules can be easily discerned; a small raised lumbo-inguinal gland present that fails to reach to the level of the thighs when legs are folded at right angles to the body; sides with smooth-surfaced pustules; posterior part of the ventral disk granular; skin of the throat and breast smooth; a large but not especially distinct parotoid gland above the arm extending nearly to the tympanum.

Color. General color on dorsal surface, olive to olive brown in life, with some scarcely discernible darker areas not forming a pattern; a dark brown stripe from tip of the snout to the eye, below which the lip is silvery or whitish; a small black spot on the tympanic region, and two or three small black spots low on the sides; a larger black spot covers most of the lumbo-inguinal gland; venter generally creamy yellow with a few indistinct darker spots which are diffuse and indistinct; upper surface of limbs with small black spots instead of bands; a large red spot on the anterior face of the femur which extends on the groin somewhat; some reddish spots on the posterior part of femur. Some scattered dark pigment on the chin.

Measurements in mm. Type; ♂. Snout to vent, 23.8; width of head, 9.5; length of head, 8.5; arm, 13.3; leg, 29.5; tibia, 10; foot, 14.

Variation. The type series displays but very little significant variation. The extent of the granulation on the ventral disk may be a little more than occurs in the type. The spots may be orange, or red-orange. This color fades and in the preserved specimens today the color is yellowish-white. Sometimes the tympanum is very indistinct, rarely more distinct than type. One darker specimen shows some minute light maculations on the dorsal surface.

Remarks. The species occurs in the pine country about Agua del Obispo. Their presence was discovered by tracing the call, which is a peculiar whistle. All were taken from trees. From the number of calls heard it would appear that the species is not rare. However, most of the calls came from high trees. Even when in reasonably low trees that could be climbed, the specimen was usually perched at the tip of a branch where the collector did not dare to venture, or more frequently where it was out of the sight of the collector. It required more than the usual amount of effort to obtain this small series.

Syrrhophus nebulosus sp. nov.

(Plate XXVII, figs. 3-5)

Type. EHT-HMS No. 3774, collected near Tonolá, Chiapas, Aug. 27, 1935, by Hobart M. Smith and Edward H. Taylor.

Paratypes. EHT-HMS Nos. 3759-3766, 3772, 3773, 3775, near Tonalá, Chiapas, Aug. 27-31, 1935; Nos. 3767, 3768, 3776, Tuxtla Gutierrez, Chiapas, Sept. 4, 1935, Nos. 3769, 3770, 3777-3779, Tapachula, Chiapas, Aug. 24, 1935;? No. 3771 near Rodriguez Clara, Veracruz. Sept. 7, 1935.

Diagnosis. Related to *pipilans* but smaller, with a somewhat narrower snout, but like it lacking the small outer palmar tubercle. The tympanum is more than one-third of the eye, and scarcely larger in males than females. Venter absolutely smooth; parotoid above arm of rather large area; inguinal gland small, indistinct; known maximum size, 25 mm. Width of upper eyelid contained in the interorbital distance one and one-half times.

Description of type. Head pointed, oval, the canthus lacking; lores sloping, not concave, perhaps slightly inflated in front of eye; distance of the nostril from tip of snout is contained twice in its distance from eye; length of eye (3.05 mm.) a little longer than the distance to the nostril (2.85 mm.) greater than width of a single eyelid (2.4 mm.); tympanum subcircular, a little higher than wide, its

greatest diameter (1.3 mm.) contained in eye length 2.42 times. A large flat parotoid gland behind and partly above the tympanum; lumbo-inguinal gland greatly reduced or absent.

Tongue moderately elongate, not notched behind, free for one-half to two-thirds of its length. Choanae large, completely concealed by the shelf from the maxillaries, when seen directly from below; no trace of vomerine teeth.

Arm slender, fingers long, very slightly widened at the tips which in normal state lack transverse grooves (indicated when disk is slightly dehydrated); second finger markedly longer than first; sub-articular tubercles large; five supernumerary tubercles on palm; a small palmar tubercle at base of first finger; less than half as large as the very large (median) palmar tubercle; no outer tubercle; a few minute granulations on palm; two or three small tubercles on wrist; no axillary gland. Leg rather short, the tibiotarsal articulation reaches to middle of the eye; tips of toes slightly dilated without grooves across tip (unless dehydrated). Two metatarsal tubercles, the inner more than double the size of the outer; subarticular tubercles large, elevated, conical; numerous small supernumerary tubercles, the skin with numerous granules; web remnant between toes scarcely discernible; fifth toe small, its free part (2.45 mm.) contained in free part of the fourth (7.15 mm. measured on inner side) nearly three times (2.9); no trace of a tarsal fold.

Skin on back smooth, with very indistinct, flattened pustules or tubercles; sides more distinctly areolate; entire venter absolutely smooth; a well-defined ventral disk; posteroventral surface of thigh partly granular; when limbs are folded at right angles to body the heels overlap about 1 mm.

Color. Above light lavender brown, forming an indefinite nebulous pattern with a moderately distinct darker brownish stripe from tip of snout along the lores to eye, then behind eye to near insertion of arm; side light faun; venter creamy white, the chin with a minute peppering of black pigment, the abdomen immaculate, save on edges; legs light brown with a suggestion of lighter areas.

Measurements of the type in mm. Snout to vent, 24; snout to foreleg, 10; width of head, 8; length of head, 9.5; arm, 16; leg, 38.

Variation. The paratype series is from several localities. The two largest females measure 25 mm., the largest male about 21 mm. Vocal sacs are present in males, the slits on the floor of the mouth elongate. Folds of skin are evident on the underside of the chin. In some specimens the choanae are not entirely concealed. A few

of the specimens have the brown color inclosing lighter spots, and one is almost uniform light brown.

The premaxillary teeth, as in all members of the genus, are prominent and drop below the general level of the maxillary teeth. These are often visible below the edge of the lip.

Remarks. Occurring in their same general region is another small black and red species still undescribed. As remarked, the relationship of *Syrrhophus nebulosus* is apparently closest to *S. pipilans*. Future collections may show that the relationship might better be shown by a trinomial. However, the material at hand does not show intergradation. It is significant that the four species on the Pacific side lack the outer palmar tubercle, while those on the gulf side usually, if not always, have it present.

Microhyla mazatlanensis sp. nov.

Microhyla olivacea Taylor (non Hallowell), Univ. Kansas Sci. Bull., Vol. 24, No. 20, 1936 (Feb. 15, 1938), p. 516.

Type. E. H. Taylor-H. M. Smith Collection, No. 1236. Collected two miles east of Mazatlán, Sinaloa, July 20, 1934, by E. H. Taylor.

Paratypes. EHT-HMS No. 1237-1238 Topotypes, same data as type.

Diagnosis. Toes without webs, the outer metatarsal tubercle absent. Related to *Microhyla olivacea* but distinctly smaller in size, the head a little narrower, the snout projecting more, a little more flattened above and rounding at the tip; eye smaller proportionally; choanae smaller, largely concealed by the shelf from the maxilla when seen from below; toes and fingers more rounded without a lateral ridge. An indistinct black stripe behind eye to some distance on side. Brown above.

Description of the type. Body moderately stout, the head somewhat triangular; snout pointed, somewhat rounded, rather than truncate, extending beyond the tip of the jaw a distance equal to about one-half the length of the snout; length of eye (2.3 mm.) equal to .8 of the snout length (2.8 mm.); eye a little longer than its distance from the nostril; width of an eyelid 2.5 times in the interorbital distance. A slight diagonal groove from the corner of the eye to the insertion of the arm, which borders a thickened area which is in the nature of a parotoid (also in other species). There is no trace of the tympanum; a transverse area between the orbits is somewhat depressed; no evidence of the transverse occipital fold; nostrils small, lateral, back a slight distance from the tip of the

snout; front of the lower jaw with a small double notch, the median part not as elevated as the sides.

Choanae large; when seen directly from below they are more than half concealed by the prominent backward projecting shelf from the premaxillaries; no vomerine teeth; a palatal ridge between the posterior part of the orbits; behind this at a distance of .8 mm. is a second less prominent ridge behind which the buccal membrane is arranged in about 19 longitudinal folds which extend to the esophagus; openings of the eustachian tubes about one-third the area of a choana; tongue of type injured (of a paratype the tongue is much longer than wide, broadly rounded at each end, not notched or emarginate, and free for about a third of its length).

Arm rather short; hand short the three large palmar tubercles, moderately elevated, the median largest and contiguous or partially confluent with the other two; subarticular tubercles moderately elevated; tips of the digits thickened, but not widened, of the same width as the remainder of the digits; first finger much shorter than the second, which in turn is shorter than the fourth.

Legs short, the tibiotarsal articulation not reaching as far as the arm insertion, and only slightly beyond the elbow of the adpressed arm; when the limbs are folded at right angles the heels overlap a little; inner metatarsal tubercle very small (about one-third the length of the first toe); no trace of an outer tubercle; no tarsal fold; tips of the toes thickened, equally as wide as the digit; foot relatively narrow.

Skin smooth above, below, and on sides (female); anal opening followed by a deep triangular groove; femora not involved in the body skin for more than half their length.

Color. Above nearly uniform brown with some scattered black spots tending to form a pattern medially; a broken black line begins behind the eye and continues to some distance on the side; trace of an inguinal spot, which together with a single bar or spot on the femur, the tibia, and foot, form a continuous line when the limb is folded. Venter cream, with a very slight peppering of pigment on the chin; sides slightly mottled with lighter and darkened; underside of the feet purplish brown, and the hands similarly colored, but to a lesser extent.

Measurements of type and paratypes in mm. Nos. 1236, 1237, 1238; sex. ♀, ♂, ♀; snout to vent, 22.2, 23.3; 24.8; width of head, 6, 6, 6.6; length of head, 6.5, 6.3, 6.5; arm, 9.8, 10.2, 11.2; leg, 28, 27.5, 31; tibia, 9.5, 9.2, 11; foot, 13, 14, 16.

Variation. The male has a well-defined vocal sac which is colored black and is visible as a blackish spot on the underside of the chin. The dorsal surface is beset with tiny, pearly-tipped tubercles, some of which are present on the dorsal surface of the arms and legs. Along the edges of the fingers and toes there is a row of sharply pointed tubercles with a few similar excrecences on the dorsal surface of the fingers and toes. A similar series of spines on the lower jaw. In the single male, the premaxillary shelf is somewhat less developed and not quite half of the choanae is concealed.

Remarks. These small specimens were obtained from a pile of rocks near a small temporary rain pool. In the same pile of stones I obtained the type of *Bufo mazatlanensis*.

These specimens were originally associated with *Microhyla olivacea*, although the differences were recognized at that time. (Taylor *loc. cit.*) Since then I have examined large series of this genus from México and have a better idea of the amount of variation that may be expected. This has caused me to regard this lowland form as distinct from *M. olivacea*.

The species differs from *Microhyla elegans*, in lacking the heavy pigmentation on the ventral surfaces, and the broad lateral stripe which begins on the tip of the snout. *Elegans* has well-defined lateral ridges or fringes on the sides of most of the digits, and the tips are flattened and somewhat widened. The inguinal spot is strongly defined.

Microhyla usta has been reported from Presidio in the southern part of Sinaloa and may also occur in this locality. This may be separated easily by the fact that *usta* has a very large inner metatarsal tubercle, and also a strongly developed outer one, while the described form has a small inner and no outer.

PLATE XXVI

FIG. 1. *Bufo nayaritensis*, from type, EHT-HMS No. 397, Tepic, Nayarit, México. x 1.

FIG. 1a. Side view of head of same. x 1.

FIG. 1b. Side view of the head of *Bufo marmoratus*. EHT-HMS No. 770, near Cinco Minas, Jalisco. x 1.

FIG. 2. *Bufo marmoratus*. EHT-HMS No. 770, near Cinco Minas, Jalisco. x 1.

FIG. 3. *Rhyacosiredon leorae*, from type. EHT-HMS No. 22560, near Río Frío, México, México. x 1.